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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,408	03/24/2004	Johannes Martinus Duisters	081468-0308928	3868
909	7590	10/31/2005	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN, LLP			FULLER, RODNEY EVAN	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
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DATE MAILED: 10/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/807,408	Applicant(s) DUISTERS ET AL.	
	Examiner Rodney E. Fuller	Art Unit 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**RODNEY FULLER**  
**PRIMARY EXAMINER**

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/24/04.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 24 recites the limitation "said magnet part and said conductor part." There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-12, 21 and 25-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki, et al. (US 2002/0012109).

Regarding claim 1, Suzuki discloses "a first housing including a first chamber (Fig. 8, ref.# 216), a first optically transmissive window (Fig. 8, ref.# 235), a second optically transmissive window (Fig. 8, ref.# 241), and at least one moveable lens (Fig. 8, ref.# 236-240; paragraph 0148, lines 6-11) positioned inside said first chamber; at least one gas exchange opening in communication with said first chamber (paragraph 0103, lines 8-21; paragraph 0228, lines 1-4); and at least one additional optical element (Fig. 7, ref.# 213) positioned outside said first housing, wherein an optical path (Fig. 7, see dotted line through center of optical system) is defined by said first optically transmissive window, said second optically transmissive window, said at least one moveable lens, and said at least one additional optical element."

Regarding claim 2, Suzuki discloses wherein the system is "constructed and arranged to receive radiation and convert said radiation into a beam of radiation for illuminating a patterning device (Fig. 7, ref.# 214)." (paragraph 0003, lines 1-4)

Regarding claim 3, Suzuki discloses wherein the system is "constructed and arranged for receiving a patterned beam of radiation and for projecting said patterned beam of radiation onto a substrate (Fig. 7, ref.# 220)." (paragraph 0003, lines 1-4)

Regarding claim 4, Suzuki discloses "wherein said at least one additional optical element comprises one of a blind, a filter, a mirror, and a lens (Fig. 7, ref.# 213)."

Regarding claim 5, Suzuki discloses "a plurality of additional optical elements (Fig. 7, ref.# 204-214) positioned outside of said first housing."

Regarding claim 6, Suzuki discloses "wherein said moveable lens is a composite lens comprising a plurality of lens elements (Fig. 8, ref.# 236-240), at least one of which is moveable in the first chamber."

Regarding claim 7, Suzuki discloses "wherein only said at least one moveable lens (Fig. 8, ref.# 236-2400) is a moveable part in said first chamber." (paragraph 0148, lines 6-11)

Regarding claim 8, Suzuki discloses "wherein said at least one moveable lens (Fig. 8, ref.# 236-2400) is the only optical element in said first chamber." (Note: As in claim 8, the one moveable lens may be made of a plurality of lens; and Figure 8 shows only the lenses in the chamber.)

Regarding claim 9, Suzuki discloses a "first gas exchange means connected to said at least one gas exchange opening." (paragraph 0103, lines 17-21)

Regarding claim 10, Suzuki discloses "wherein said first gas exchange means comprises at least one of a pump and a container with a gas." (paragraph 103, lines 8-21)

Regarding claim 11, Suzuki discloses "wherein the at least one gas exchange opening is sealable." (paragraph 0230, lines 1-8)

Regarding claim 12, Suzuki discloses "wherein the at least one gas exchange opening comprises a gas supply opening (Fig. 1, ref.# 43) and a gas exhaust opening (Fig. 1, ref.# 44)." (paragraph 103, lines 8-21)

Regarding claim 21, Suzuki discloses "a lens actuator (Fig. 8, ref.# 242-246) for moving said at least one moveable lens (Fig. 8, ref.# 236-240)."

Regarding claim 25, Suzuki discloses "a first housing (Fig. 1, ref.# 100) including a first chamber (Fig. 8, ref.# 216) inside said first housing, a radiation source (Fig. 1, ref.# 1), a first optically transmissive window (Fig. 8, ref.# 235), and at least one moveable lens (Fig. 8, ref.# 236-240) in said first chamber; at least one gas exchange opening in communication with said first chamber (paragraph 0103, lines 8-21; paragraph 0228, lines 1-4); and at least one additional optical element positioned outside said first housing (Fig. 7, ref.# 213), wherein an optical path (Fig. 7, see dotted line through center of optical system) is defined by said radiation source of radiation, said at least one moveable lens, said first optically transmissive window, and said at least one additional optical element."

Regarding claim 26, Suzuki discloses "providing a beam of radiation for illuminating a patterning device (Fig. 7, ref.# 214)." (paragraph 0003, lines 1-4)

Regarding claim 27, Suzuki discloses "a radiation system (Fig. 1, ref.# 1) configured to provide a beam of radiation, said radiation system including: a first housing (Fig. 1, ref.# 100) including a first chamber (Fig. 8, ref.# 216), a first optically transmissive window (Fig. 8, ref.# 235), a second optically transmissive window (Fig. 8, ref.# 241), and at least one moveable lens (Fig. 8, ref.# 236-240) positioned inside said first chamber, at least one gas exchange opening in communication with said first chamber (paragraph 0103, lines 8-21; paragraph 0228, lines 1-4), and at least one additional optical element (Fig. 7, ref.# 213) positioned outside said first housing, wherein an optical path (Fig. 7, see dotted line through center of optical system) is defined by said first optically transmissive window, said second optically transmissive window, said at least one moveable lens, and said at least one additional optical element; a support structure (Fig. 7, ref.# 215) configured to support a patterning device (Fig. 7, ref.# 214) that imparts a desired pattern onto said beam of radiation; a substrate holder (Fig. 7, ref.# 221) configured to hold a substrate (Fig. 7, ref.# 220); and a projection system (Fig. 7, ref.# 216) configured to project said patterned beam onto a target portion of said substrate."

Regarding claim 28, Suzuki discloses "wherein, with respect to said optical path, said optical system (Fig.7, ref.# 216) and said at least one additional optical element (Fig. 7, ref.# 213) are positioned on a same side of said support structure (Fig. 7, ref.# 221)."

Regarding claim 29, Suzuki discloses " a first housing (Fig. 1, ref.# 100) including a first chamber (Fig. 8, ref.# 216) inside said first housing, a radiation source (Fig. 1,

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ref.# 1), a first optically transmissive window (Fig. 8, ref.# 235), and at least one moveable lens (Fig. 8, ref.# 236-240) in said first chamber, at least one gas exchange opening in communication with said first chamber (paragraph 0103, lines 8-21; paragraph 0228, lines 1-4), and at least one additional optical element positioned outside said first housing (Fig. 7, ref.# 213) , wherein an optical path (Fig. 7, see dotted line through center of optical system) is defined by said radiation source of radiation, said at least one moveable lens, said first optically transmissive window, and said at least one additional optical element; a support structure (Fig. 7, ref.# 215) configured to support a patterning device (Fig. 7, ref.# 214) that imparts a desired pattern onto said beam of radiation; a substrate holder (Fig. 7, ref.# 221) configured to hold a substrate (Fig. 7, ref.# 220); and a projection system (Fig. 7, ref.# 216) configured to project said patterned beam onto a target portion of said substrate."

Regarding claim 30, Suzuki discloses "wherein, with respect to said optical path, said optical system (Fig. 7, ref.# 216) and said at least one additional optical element (Fig. 7, ref.# 213) are positioned on a same side of said support structure (Fig. 7, ref.# 221)."

Regarding claim 31, Suzuki discloses "a support structure (Fig. 7, ref.# 215) configured to support a patterning device (Fig. 7, ref.# 214) that imparts a desired pattern onto said beam of radiation; a substrate holder (Fig. 7, ref.# 221) configured to hold a substrate (Fig. 7, ref.# 220); and a projection system (Fig. 7, ref.# 216) configured to project said patterned beam onto a target portion of said substrate, said projection system comprising, a first housing including a first chamber (Fig. 8, ref.# 216), a first

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optically transmissive window (Fig. 8, ref.# 235), a second optically transmissive window (Fig. 8, ref.# 241), and at least one moveable lens (Fig. 8, ref.# 236-240) positioned inside said first chamber, at least one gas exchange opening in communication with said first chamber (paragraph 0103, lines 8-21; paragraph 0228, lines 1-4), and at least one additional optical element (Fig. 7, ref.# 213 positioned outside said first housing, wherein an optical path (Fig. 7, see dotted line through center of optical system) is defined by said first optically transmissive window, said second optically transmissive window, said at least one moveable lens, and said at least one additional optical element."

Regarding claim 32, Suzuki discloses "wherein said at least one additional optical element (Fig. 7, ref.# 218) is positioned between said support structure (Fig. 7, ref.# 215) and said substrate holder (Fig. 7, ref.# 221)."

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki, et al. (US 2002/0012109) in view of Hunter, et al. (US 2005/0199598).

Suzuki discloses all the structure set forth in the claims, except (claim 13) "wherein a gas bearing is provided for the moveable lens." However, the use of air



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bearings are well known in the art at the time of the invention as is evident from the teaching of Hunter (See paragraph 0033, 0120). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize air bearings with the movable lens of Suzuki in order to "overcome limitations in accuracy and reliability" as noted by Hunter (See paragraph 0120)

6. Claims 14, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki, et al. (US 2002/0012109) in view of Taniguchi, et al. (US 2002/0008863).

Suzuki discloses that the moving lens are moved by "driving elements 242-246" that may be "formed of a piezo-electric device." (paragraph 0148) Thus, Suzuki does not explicitly disclose that the moveable lens are moved by (claim 14) "a piston which is moveable in a cylinder with pressurizable gas" or (claims 22 and 23) "wherein said lens actuator comprises a linear motor with a magnet part and a conductor part, wherein said moveable lens is connected to one of said conductor part and said magnet part."

However, Taniguchi teaches that a variety of driving mechanisms may be utilized to move a lens in an optical system. Specifically, Taniguchi teaches that "a motor, air piston, piezoelectric element, etc.) may be utilized to move a lens. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize either a piston (claim 14) or an electric linear motor (claims 22 and 23) in place of the piezoelectric device of Suzuki. The ordinary artisan would have been motivated to modify Suzuki to take advantage of the inherent benefits (costs, size, speed, accuracy, etc.) of each type of equivalent moving mechanism for a lens.

7. Claims 15-20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki, et al. (US 2002/0012109) in view of Murayama, et al. (US 6,341,006). Suzuki discloses all the structure set forth in the claims, except Suzuki discloses a single large chamber (ref.# 100) with another chamber (ref.# 216) with windows (ref.# 235, 241). The optical elements from ref.# 4 to ref.# 16 are thus in a single environmental chamber of ref.# 100. Thus, Suzuki does not disclose (claim 15) "at least one second housing, with a second chamber inside said second housing and with a third and fourth optically transmissive window and accommodating at least one of said at least one additional optical element in said second chamber," (claim 16) "wherein said at least one second housing comprises at least one gas exchange opening in communication with said second chamber," (claim 17) "wherein said at least one gas exchange opening is sealable," (claim 18) a "second gas exchange means connected to said gas exchange opening," (claim 19) "wherein said first housing is releasably connected to at least one second housing," and (claim 20) "wherein one of said optically transmissive windows of said first housing and one of said optically transmissive windows of said at least one second housing form a common optically transmissive window." However, Murayama teaches that the use of separate gas filled chambers with separating windows for the illumination optics of a lithography system was well known in the art at the time of the invention. (See Murayama, Fig. 1, ref.# 18a-18d; column 3, lines 10-15) Thus, it would have obvious to one of ordinary skill in the art at the time the invention was made to modify Suzuki by including gas controlled multiple

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chambers with transmissive windows. The ordinary artisan would have been motivated to modify Suzuki as discussed above in order to reduce the time to fill the areas around the optical elements with gas as discussed by Murayama (see column 3, lines 1-9)

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Shiraishi (US 6,842,221), Schroeder, et al. (US 6,825,914), Hara, et al. (US 6,714,277), Hayashi, (US 6,633,364), Akagawa, et al. (US 6,288,769), Hase, et al. (US 6,252,648), Straaijer, et al. (US 5,602,683) and Hamatani (US 5,425,045) each disclose an optical system with a gas filled housing, a first and second transmissive window, and a lens inside the housing.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney E. Fuller whose telephone number is 571-272-2118. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rodney E Fuller  
Primary Examiner  
Art Unit 2851

October 24, 2005

A handwritten signature in black ink, appearing to read 'R. E. Fuller', is written over the printed name of the examiner.